

USSR

UDC: 621.391.2:621.396.96

BRYUKHOVETSKIY, A. S., PUZENKO, A. A.

"On the Signal Spectrum in the Case of Transverse Motion of Shadowed Reflectors"

Moscow, Radiotekhnika i Elektronika, Vol 15, No 12, Dec 70, pp 2533-2538

Abstract: The effect which reflector shadowing has on the spectrum of a radar signal is considered in the geometric optics approximation for the case of a system of reflectors in the form of N strips perpendicular to the yz -plane and of infinite extension in the Ox -direction. For the sake of simplicity in calculations, the statistical properties of all reflectors are assumed to be identical: a) the size distribution of all plates is described by the same function; b) all plates undergo random statistical independent oscillations relative to the equilibrium position $y = 0$ in the Oy direction; c) the two-dimensional distribution density for probability of the position of the centers of the plates is $w_2(y_1, y_1, \tau)$ (motion is assumed to be a random stationary process); d) the system of reflecting strips is a cophased array, i.e. the distance between strips is an integral multiple of half-waves. In the case of two reflectors moving crosswise of a radar beam according to a harmonic law with random initial phase, an exact expression is found for the energy spectrum. The spectrum is symmetric relative to the frequency of the incident wave, $1/2$

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BRYUKHOVETSKIY, A. S., PUZENKO, A. A., Radiotekhnika i Elektronika, Vol 15,
No 12, Dec 70, pp 2533-2538

and consists of an infinite series of discrete frequencies, the distance between them being twice the frequency of motion of the reflectors. The intensity of the high-frequency components decreases asymptotically in inverse proportion to the fourth power of the number of the harmonics. In conclusion the authors thank V. B. Razskazovskiy and G. P. Kulemin who brought the problem to the attention of the authors, and P. V. Bliokh for constant interest and assistance.

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UDC 542.91:547.586.2:547.466:547.1'118

KARPAVICHYUS, K. I., POSHKENE, R. A., PUZERAUSKAS, A. P., KIL'SIHEVA, O. V.,
KNUNYANTS, I. L., Institute of Biochemistry of the Lithuanian SSR Academy
of Sciences and the Institute of Hetero-Organic Compounds of the USSR
Academy of Sciences

"p- and m-aminophenylalkene Acids and Their Derivatives Containing diethylene-
diimidophosphoryl and diethylenediimidothiophosphoryl Groups"

Moscow, Izvestiya Akademii Nauk SSR - Seriya Khimicheskaya, No 11, 1972,
pp 2549-2554

Abstract: The methyl esters of p- and m-aminophenylalkane acids and the
methyl esters of N-(p- and m-aminophenacyl)-DL-valine (R. Poshkene, et al.,
Tr. AN Lit-SSR, Series B, 1971) were phosphorylated by phosphorus oxychloride
or phosphorus thiooxychloride in inert solvents in the presence of bases.
Without separating the dichlorophosphoryl derivatives into individual forms
they were condensed with ethyleneimine by the method of N. Bestian (Liebings
Ann. Chem., No 566, 210, 1950). The HCl separating out was found by triethyl-
amine or an excess of ethylenimine. Thus, the methyl esters and sodium salts
of para and meta-aminophenylalkanes acids containing diethylenediimidophosphoryl
and diethylenediimidothiophosphoryl groups were synthesized, and the methyl

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KARPAVICHYUS, K. I., et al., Izvestiya Akademii Nauk SSR -- Seriya Khimicheskaya, No 11, 1972, pp 2549-2554

esters and sodium salts of DL-valine, acylated by the para and meta-amino-phenylalkanes acids containing diethylenediimidophosphoryl groups were obtained. The experimental procedures and results are described, and the physical and chemical properties of the compounds are tabulated.

2/2

USSR

UDC 612.11

PUZEVSKAYA, R. N., recommended by Chair of Zoology, Arzamask Pedagogical Institute

"Changes in the Absolute Number of the Various Leukocytes During Emotional Excitation"

Moscow, Biologicheskiye Nauki, No 8(104), 1972, pp 50-54

Abstract: Blood counts performed on students prior to, during, and after examinations revealed that the absolute number of neutrophilic leukocytes increases in over 80% of individuals during emotional excitation, including those who feel no stress and whose blood pressure and heart rate remain normal. This increase in segmented, rod-shaped, and young neutrophils results in leukocytosis in 50% of the cases. At the same time, the number of lymphocytes decreases, causing lymphopenia even in the presence of leukocytosis. The number of other white blood cells remains essentially constant. It is concluded that in emotional excitation, maturation and release of neutrophilic cells into the circulation are accelerated.

1/1

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USSR

UDC 669.1:539.166

NIKOLAYEV, I. N., MAKAROV, V. A., PUZEY, I. M., and PAVLYUKOV, L. S., Moscow Engineering Physics Institute, Institute of Precision Alloys, and Central Scientific Research Institute of Ferrous Metallurgy imeni I. P. Bardin

"Mossbauer Effect in Fe-Ni-Mn Invar Alloys"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 35, No 6, June 73, pp 1305-1307

Abstract: The Mossbauer effect was studied for nuclei of Fe^{57} in five samples $Fe_{65.5}(Ni_{1-x}Mn_x)_{34.5}$ in the interval $0.2 < x < 0.8$. After melting, the samples were annealed for five hours at $1000^{\circ}C$ and hardened. The resulting alloys were rolled into foil and annealed again for 0.5 hours at $700^{\circ}C$. Geometry of transmission was used in two modes of spectra measurements: constant velocities and constant accelerations. The method of spectra interpretation was done by determining the positions of centers of gravity of all samples at temperatures above $100^{\circ}K$ with an accuracy of ± 0.006 mm/sec. A $Co^{57}(Cr)$ was used at room temperature while sample temperature was varied from 4.2 to $370^{\circ}K$. A diagram of the magnetic states of the alloys was produced from the temperature relationship of the Mossbauer spectra, which revealed alloys

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NIKOLAYEV, I. N., et al., Fizika Metallov i Metallovedeniye, Vol 35, No 6, Jun 73, pp 1305-1307

$\text{Fe}_{65.5}\text{Ni}_{5.5}\text{Mn}_{29}$, $\text{Fe}_{65.5}\text{Ni}_{26}\text{Mn}_{8.5}$, and $\text{Fe}_{65.5}\text{Ni}_{28}\text{Mn}_{5.5}$. The first alloy above was antiferromagnetic and is a doublet with a relatively small average and super-thin magnetic field. An anomaly was noted in the behavior of $\varepsilon(T)$ which was explained by the fact that the relative shift in the spectrum is compensated by a chemical shift that decreases the total shift with reduced temperature. In this case the decrease in isomeric chemical shift signifies an increase in the density of s-electrons in Fe^{57} nuclei and that there is a change in the electron configuration of the iron atoms during the transition from the paramagnetic to the ferromagnetic state. YE. G. PONYATOVSKIY and G. T. DUBOVKA rendered assistance in this work. 2 figures, 5 bibliographic references.

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1/2 016
UNCLASSIFIED
TITLE--ORDERING OF THE NICKEL, IRON, COBALT ALLOYS IN THE GAMMA REGION -U-
AUTHOR--(04)-GOMANKOV, V.I., PUZEY, I.M., MALTSEV, E.I., PETRENKO, E.D.
COUNTRY OF INFO--USSR
SOURCE--FIZIKA METALLOV I METALLOVEDENIE, FEB. 1970, 29, (2), 429-431
DATE PUBLISHED----FEB70
SUBJECT AREAS--MATERIALS
TOPIC TAGS--ORDERED ALLOY, ALLOY PHASE COMPOSITION, NEUTRON DIFFRACTION,
COBALT CONTAINING ALLOY, IRON NICKEL ALLOY, ALLOY COMPOSITION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3003/0345
CIRC ACCESSION NO--AP0129577
STEP NO--UR/0126/70/029/002/0429/0431
UNCLASSIFIED

2/2 016

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0129577

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CHARACTERISTICS OF THE ORDERING PROCESS IN ALLOYS IN THE GAMMA REGION OF THE NI-FE-CO SYSTEM WERE STUDIED BY NEUTRON DIFFRACTION, WITH SPECIAL REF. TO THE SPECIFIC PART PLAYED BY CO IN THIS PROCESS. THE ORDERING CHARACTERISTICS ARE LARGELY DETERMINED BY THE DEVELOPMENT OF A SUPERSTRUCTURE OF THE NI SUB3 FE TYPE; THE ADDITION OF CO TENDS TO DISRUPT THIS SUPERSTRUCTURE BECAUSE THERE IS A STRONGER INTERACTION BETWEEN THE FE AND CO THAN BETWEEN THE FE AND NI.

UNCLASSIFIED

USSR

UDC 551.511

PUZHLYAKOVA, G. A., CHUDAKOV, I. G.

"Coefficient of Turbulence of a Planetary Boundary Layer"

V sb. Vopr. Klimata i pogody Nizhn. Povolzh'ya. Vyp. 7 (Problems of the Climate and Weather of Lower Povolzh'ye. No 7--collection of works), Saratov, Saratov. un-t 1971, pp 3-14 (from RZh-Mekhanika, No 10, Oct 71, Abstract No 10B747)

Translation: The well known Ackerblom solution for wind speed components in an atmospheric boundary layer is found with a number of simplifying assumptions which are frequently not satisfied in reality. This shows up in particular when this solution is taken as the basis for determining the coefficient of turbulence in the boundary layer. In this connection it is proposed that the simplifications be applied not to the boundary layer in its entirety, but rather to individual thin layers where the development of turbulence corresponds to the ruling principles of the Ekman spiral.

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USSR

PUZHLYAKOVA, G. A., CHUDAKOV, I. G., Vopr. klimata i pogody Nizhn. Po-
volzh'ya. Vyp. 7, Saratov, Saratov. un-t, 1971, pp 3-14

In order to get around the problem of determining the geostrophic wind speed on the upper surface of the boundary layer, an expression is found for the velocity field which is invariant in the entire boundary layer with respect to the change in the thermobaric field, and which depends only on the coefficient of turbulence. If the values of this invariant are calculated in turn from data of weather balloon observations of the wind, the coefficient of turbulence may be found for each individual turbulent layer. To facilitate calculations of the coefficient of turbulence directly from the data of weather balloon observations, an auxiliary table is appended. Mean values of the coefficient of turbulence are presented for a specific locality. S. A. Bortnikov.

2/2

Acc. Nr.: **AP0031144**

P
Ref. Code: UR 0219

PRIMARY SOURCE: Byulleten' Eksperimental'noy Biologii i
Meditsiny, 1970, Vol 69, Nr 1, pp 93-94

ACTIVITY OF SUCCINIC DENYDROGENASE IN THE ORGANS OF WHITE RATS
AFTER INTOXICATION WITH THE TOXIN OF THE SNAKE "GUERZA"

V. I. Puzik, A. T. Berdyeva, M. Ya. Dyukanova

Central Research Institute of Tuberculosis, Moscow, Institute of Regional Medicine
Ashkhabad

The authors report on results of histochemical study of the activity of succinate dehydrogenase after intoxication with the poison of the snake "guerza". Marked difference was found in the distribution and activity of the enzyme in various organs. Character of changes of the activity depended on the dose and the duration of action of the poison.

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UDC 577.1:615.7/9

PUZIK, V. I., BERDYEVA, A. T., DYUKANOVA, M. YA.

"Activity of Succinate Dehydrogenase in Organs of White Rats During Intoxication With Vipera Lebetine Poison"

Byul. Eksperim. biol. i med. (Bulletin of Experimental Biology and Medicine), Vol 69, No 1, 1970, pp 93-94 (from Referativnyy Zhurnal - Biologicheskaya Khimiya, No 14, 25 Jul 70, Abstract No 14 F1944)

Translation: Studied were the effects of a toxic and a lethal dose of Vipera lebetina poison on the specific histochemical activity of succinate dehydrogenase (I) of the liver, kidneys, myocardium, lung tissue, and brain of white rats. The character of the changes in the activity of I depends on the duration and dose of the poison. As a rule, the drop in activity of I corresponds to the extent of dystrophic changes in the parenchymal organs.

Yu. Loykin

USSR

UDC 616.919:598.12-07:616-000.931:577.156-074

P
PUZIK, V. I., BRIDYeva, A. T., and DYUKANOVA, N. YA., Pathomorphology Department, Central Scientific Research Tuberculosis Institute, Ministry of Health USSR, and Institute of Regional Medicine, Academy of Sciences, Turkmen SSR

"Succinic Dehydrogenase Activity in Organs of White Rats Poisoned with Viper Venom"

Moscow, Byulleten' Eksperimental'noy Biologii i Meditsiny, No 1, 1970, pp 93-94

Abstract: Injection of rats with viper venom markedly affected succinic dehydrogenase (SD) activity. The nature of the changes varied with the dose and duration of action of the poison. Toxic doses (4 mg/kg) produced degenerative changes in the liver, kidneys, then in the myocardium and brain. Toxic doses sharply lowered SD activity at the same time. Lethal doses (10 mg/kg) brought about degenerative changes within 10 minutes in organs, similar to those observed with toxic doses after 24 hours. Initially, SD activity was lowest in the myocardium and kidneys. At the time of respiratory arrest, there was a sharp decrease in SD activity in the liver
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PWZIK, V. I., et al., Moscow, Svyulleten' Eksperimental'noy Biologii i Meditsiny, No 1, 1970, pp 93-94

and lungs, but a slight increase in the kidneys, myocardium, and brain. The increase in activity of the enzyme is ascribed to the increased permeability of the blood vessels and cellular membranes due to poisoning by viper venom.

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USSR

UDC 539.3:534.1

KUZ'MICH, A. N., PUZIKOV, A. A. and SOKOLOV, YE. N.

"Some Questions of the Damping of Laminated Plates"

Kiev, Rasseyaniye energii pri kolebaniyakh mekh. sistem (The Dissipation of Energy During Oscillations of Mechanical Systems, Collection of Works), Nauk. dumka, 1972, pp 222-230 (from Referativnyy Zhurnal -- Mekhanika, No 4, 1973, Abstract No 4V332 by E. I. Sokolov)

Translation: Some results of theoretical and experimental investigations of the bending oscillation of thin plates, the material of which possesses hereditary characteristics, are presented. In order to describe these characteristics the use of the Boltzmann-Volterra theory of heredity is proposed

$$\sigma(t) = E \epsilon(t) - \int_0^t R(t-s) \dot{\epsilon}(s) ds \quad (1)$$

where $\sigma(t)$ is the stress; $\epsilon(t)$ is the linear deformation; E is the instantaneous module of elasticity; $R(t-s)$ is the center of relaxation, for the calculation of which a theoretical-experimental method was worked out, the substance of which is presented below.

If for deducing an equation, describing the transverse oscillation of a plate, relationship (1) is used, and the equation obtained is solved by the

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KUZ'MICH, A. N., Rasseyaniye energii pri kolebaniyakh mekh. sistem, 1972, pp 222-230

method of separation of variables $w(x,y,t)=W(x,y) \phi(t)$, in which $w(x,y,t)$ is the sag of the plate, then we obtain two equations, one of the plate oscillation and the other the function $\phi(t)$

$$\phi(t) + w^2 \phi(t) - w^2 \int_0^t \phi(s) [\phi(s) + \phi(s)] R(t-s) ds = 0 \quad (2)$$

here w is the characteristic frequency of an ideally elastic plate. Inasmuch as obtaining the form of the function $\phi(t)$ in experimental investigations is sufficiently simple (its graph is a vibrogram of oscillation of points of the normalized plate), so from (2) it is possible by well known methods to find the form of the function $R(t-s)$. Equations of type (2) are obtained for homogeneous and three-layer plates with a filler under shear stress, and external layers under shear and tensile stress. The further content of the work concerns only experimental results on the determination of the function $\phi(t)$ for partial cases with certain conclusions on the vibration-absorbing properties of the investigated constructions of plates and their materials. (14 bibliographic entries)

USSR

UDC: 53.083.5

KAZACHKOVSKIY, V. V., POSIN, V. P., PUZIKOV, V. A., YAKOVENKO, V. A.,
YANUSHEVSKIY, V. A.

"A Device for Determining the Optical Difference of a Path by the St.
Harmon Method"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obratztsy, Tovarnyye Znaki,
No 36, Dec 71, Author's Certificate No 322747, Division G, filed 3 Jul 69,
published 30 Nov 71, p 155

Translation: This Author's Certificate introduces a device for determining the optical difference of a path by the St. Harmon method. The device contains a light source, an analyzer, a polarizer, a $\frac{1}{4}$ -wave plate with a photoelectric angle-of-turn pickup and display, a photoreceiver with module for marking the extremum value of the photocurrent connected to the registration unit. As a distinguishing feature of the patent, errors are eliminated in automatic determination of a whole number of orders of optical difference in a path and in finding the direction of the algebraically larger permittivity tensor by using a wedge compensator with photoelectric displacement pickup, display and registration unit which is equipped with a logical correction unit whose output is connected to the display.

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1/2 009 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--SYNTHESIS OF CARBOXYLIC ACID DERIVATIVES FROM CARBON MONOXIDE,
DELFIN, AND ACYLATING COMPOUNDS UNDER ACID CATALYSIS CONDITONS. 30.
AUTHOR--(03)--YANG, Y.P., PUZITSKIY, K.V., YEIDUS, YA.T.
COUNTRY OF INFO--USSR
SOURCE--IZV. AKAD. NAUK SSSR, SER. KHIM. 1970, (2), 424-30
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--ISOBUTYLENE, BUTANOL, CARBON MONOXIDE, CARBOXYLIC ACID,
CHEMICAL SYNTHESIS, CATALYST
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1997/0855 STEP NO--UR/0062/70/000/002/0424/0430
CIRC ACCESSION NO--AP0119759
UNCLASSIFIED

2/2 009

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0119759

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. KINETIC DATA WERE SHOWN GRAPHICALLY FOR THE TITLE REACTION OF CARBONYLATION OF ISO, BUOH WITH VARIOUS PROPORTIONS OF ROH, BF SUB3 H SUB2 O AND CO PRESSURE AT 100DEGREES. THE MAIN PRODUCTS OF THE REACTION ARE ME SUB3 CCO SUB2 H (I) AND ITS ISO, BU ESTER (II). THEIR YIELDS AND PROPORTIONS ARE AFFECTED BY TEMP. AND CATALYST CONC. CARBONYLATION OF ME SUB2 C:CH SUB2 GAVE MAINLY ME SUB3 CCO SUB2 H. THE YIELD IN I IN THE 1ST REACTION SEQUENCE DECLINED FROM 70-80PERCENT WHEN THE PROPORTION OF ROH TO THE CATALYST WAS RAISED FROM 1.0 TO 2.0 OR 3.0 AND BECAME VERY LOW AT THE RATIO OF 2.0. THE YIELD OF II REACHED A MAX. (LARGER THAN 85PERCENT) AT 2:1 RATIO OF ROH TO CATALYST. THE YIELDS OF 2,2,4,4,TETRAMETHYLPENTACARBOXYLIC ACID AND TRIMERIC C SUB13 ACID ROSE MODERATELY ON INCREASING THE RATIO OF ME SUB2 C:CH SUB2 TO THE BF SUB3 CATALYST FROM 0.5 TO 1.0 AND TO 1.5. THE BEST YIELD OF II OF 89PERCENT WAS REACHED WITH ROH, CATALYST RATIO 2:1; THIS MADE POSSIBLE A CONTROL OF THE REACTION TO YIELD EITHER I OR II AS THE MAIN PRODUCT. A REACTION SCHEME WAS PROPOSED.

FACILITY: INST. ORG. KHIM. IM. ZELINSKOGO, MOSCOW, USSR.

UNCLASSIFIED

Acc. Nr:

APC049802

Abstracting Service:
CHEMICAL ABST. 5-70

Ref. Code:

UR0138

P

101498k Rubber-to-plastic bonding in the vulcanization process. Glagolev, V. A.; Il'in, N. S.; Kornev, A. E.; Puzrin, B. S. (Mosk. Int. Tolkoi Khim. Tekhnol. im. Lomonosova, Moscow, USSR). *Kauch. Rezina* 1970, 29(1), 30-2 (Russ). Natural rubber and synthetic rubbers (Nairit, SKN-26, and SKI-3) were bonded to polyamide, polycarbonate films or glass cloth laminate surfaces with Leikonat (isocyanate adhesive). The bonding of these rubbers to polyethylene or polypropylene required the pretreatment of their surfaces with aq. KMnO_4 soln. Diagrams show the changes of adhesion between these rubbers and polymers in the 20-140° range.

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19801724

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USSR

UDC 577.1:615.7/9

PUZYREV, A. A., SHVARTSMAN, I. YE., and SHYLYAKHETSKIY, N. S.

"Morphological Changes and Synthesis of DNA in the Cells of the Pancreas of White Rats Acutely Intoxicated with Perfluortriethylamine"

Tr. Leningr. san.-gigiyen. med. in-ta (Transactions of the Leningrad Medical Sanitation and Hygiene Institute), No 100, 1972, pp 100-103 (from RZh-Biologicheskaya khimiya, No 12, Jun 73, Abstract No 12 F 2049)

Translation: Rats weighing 140-150 grams were subjected to inhalatory poisoning with perfluortriethylamine (I) in a maximally tolerable concentration (850 mg/l) and 1-10 days later a historadioautographic study was made of the synthesis of DNA in the pancreas. A day after the action of I an increase in the labeling index (inclusion of H^3 -thymidin) in the epithelium of ducts while in the epithelium of terminal sections and the islets of Langerhans suppression of DNA synthesis and mitotic activity is observed. On the third day after poisoning, these changes are practically preserved while by the tenth day the suppressed proliferative activity of the epithelium of the pancreas is replaced by a sharp increase in the number of DNA-synthesizing cells in the terminal sections and islets of Langerhans; in the epithelium of ducts the DNA synthesis occurs with an intensiveness equal to the control figures.

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USSR

UDC 669.183.18.046.58

POVOLOTSKIY, D. YA., MISHCHENKO, V. YA., VYATKIN, G. P., and
PUZYREV, A. V., Chelyabinsk Polytechnical Institute

"Physiocochemical Properties of Melts of the $\text{CaO-Al}_2\text{O}_3\text{-CaF}_2$
System"

Moscow, Ivestiya Vysshikh Uchebnykh Zavedeniy -- Chernaya
Metallurgiya, No 12, 1970, pp 8-12

Abstract: An experimental study was made of the electrical conductivity, ductility, and surface tension of synthetic slags of the $\text{CaO-Al}_2\text{O}_3\text{-CaF}_2$ system (2 -- 61% CaO ; 29 -- 56% Al_2O_3 ; 0 -- 60% CaF_2) at temperatures at 1400-1800° C. The effect of temperature and chemical composition on the properties of slags is presented graphically on sections of ternary diagrams. In the studied area of composition slags adjacent to the angle CaF_2 possess maximum electrical conductivity and slags adjacent to the angle CaF_2 possess minimum ductility. Calcium fluoride possesses the highest surface activity. Introduction of 0 to 60% of calcium fluoride into the melt reduces the surface tension at $t = 1700^\circ \text{C}$ from 550 to 254 erg/cm^2 .

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USSR

UDC 621.372.837

PUZYREV, V. A., VOLOSHCHENKO, YU. I.

"Thin Ferromagnetic Film Microwave Switch"

Tr. Mosk. aviats. in-ta (Works of Moscow Aviation Institute), 1970, vyp. 215, pp 206-217 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4B174)

Translation: Results are presented from theoretical and experimental investigation of a thin ferromagnetic film microwave commutator. There are 7 illustrations and a 3-entry bibliography.

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PUZYREV, L.N.

Atomic reactors

PUZYREV, L.N.

Atomic Reactors

JPRS 54787

23 December 1971

UDC 621.311.25.62.039.536.001.5
RELEASE VALVE FOR PROTECTING HERMETICALLY SEALED
AREAS OF ATOMIC POWER STATIONS

Article by D. K. Mal'tsev, Yu. V. Fomenkov, candidates of technical sciences; N. N. Puzrev, and A. G. Gorylov, engineers; All-Union Technological Institute Moscow, Teplotekhnika, Moscow, No 5, 1971, pp 62-65.

Radiation materials are formed and accumulated in the reactor and coolant during the operation of an atomic power station. The possibility of their leakage and spread throughout the neighborhood of the station represents a danger. Leakage of radioactive products from the station represents a danger under normal operation through leaks in the primary loop pipes, radioactive coolant loop. Methods for preventing accidents with a break in the pipe are determined by the concept of maximum accident. Most widespread is the theory according to which one should take into account the possibility of instantaneous rupture of the line of pressure diameter (0.5-0.6 m). This has led to the development of shielding shell-containers intended to contain all the coolant considering the energy of residual heat release and the energy of exothermal reactions which may occur at high temperatures between the core materials and the coolant.

Another, less widespread concept of the maximum accident is based on experience in using pipelines in ordinary thermal power stations. Analysis of statistical data on ruptures of lines showed that the probability of their damage for reasons of an operational nature is very small and reduces with an increase in the diameter of the line. Since corrosion and fatigue damage develop slowly, they may be observed and prevented in time under correct control.

In ruptures of lines of small diameter, mating of the reactor core or damage to it in a large scale can be prevented in general or at least in the initial stage of the accident. These considerations have led to the

- 1 -

[1 - USSR - G]

1/2 007 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--IMPROVEMENT IN THE WAXING OF CANVAS TENT FABRICS -U-
AUTHOR-(05)-~~ALTEPDESOTSKIY~~, F.L., ARTEMOVA, L.A., INVANOVA, V.E., PUZYREV,
M.F., SIDROVA, Z.A.
COUNTRY OF INFO--USSR
SOURCE--TEKST. PROM. (MOSCOW) 1970, 30(2), 53-4
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS, MILITARY SCIENCES
TOPIC TAGS--CANVAS EQUIPMENT, TENT, WAX
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--3002/1120 STEP NO--UR/0342/70/030/002/0053/0054
CIRC ACCESSION NO--AP0128547
UNCLASSIFIED

2/2 007

CIRC ACCESSION NO--AP0128547

UNCLASSIFIED

PROCESSING DATE--27NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT OF THE RATIO OF FABRIC
LEVEL RATE (V SUBR) TO THE COATING ROLLER SURFACE TRAVEL (IN THE SAME
DIRECTION) RATE (V SUBR) ON THE AMT. (Q) OF PARAFFIN DEPOSITED TO TENT
FABRIC WAS DETD. THE OPTIMUM ANGLE (PHI) SUBTENDED BY THE CLOTH
CONTACTING AND LEAVING THE ROLLER WAS SIMILAR TO 15DEGREES, THE DEPTH
(H) OF THE ROLLER IMMERSION IN PARAFFIN, KEPT AT 80-95DEGREES, WAS 40-5
MM, THE CLOTH TEMP. 110-150DEGREES, AND THE ROLLER TEMP. 114-170DEGREES.
Q INCREASED WITH INCREASING V SUBF-V SUBR, AND COULD BE REGULATED BY
CHANGING BOTH H AND PHI.

UNCLASSIFIED

PUZYREV, P.A.

Radio engineering / microwave switches

PUZYREV, P.A.

Radio engineering / microwave switches

JPRS 54764

22 December 1971

NONLINEAR AND MICROWAVE RADIO ENGINEERING SYSTEMS

Selected articles from the Russian-language book edited by L. D. Bakhrakh, corresponding member of the USSR Academy of Sciences and V. I. Samoylenko, candidate of engineering sciences: *Moskovskiy gosudarstvennyy radiofizicheskiy universitet. Radiotekhnika i elektronika. Seriya: fiziko-matematicheskie nauki. 1970, vol. 15, no. 2, p. 215, 1970, signed to press 14 October 1970.*

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- a - [I - USSR - F]

UDC 649.7.051:641.47.001
A MICROWAVE SWITCH BASED ON
THIN FERROMAGNETIC FILM

Candidate of Engineering Sciences P. A. Puzrev
and Engineer Yu. I. Voloshchenko

DRG 206-227

In modern microwave-frequency equipment, together with the widely used nonmetallic magnetic materials, such as ferrites, metallic magnetic materials in the form of thin ferromagnetic films (TFP), are finding wider and wider application. Elements fabricated on the basis of TFP are characterized by an increased resistance to radiation background, light weight, economy of operation, and a large range of working temperatures (from -100 to +200 degrees C). Controlled nonlinear parameters of thin ferromagnetic films considerably expand the region of their application. The physical properties of TFP have made it possible to develop a switch operating in the gigahertz frequency range on the basis of them.

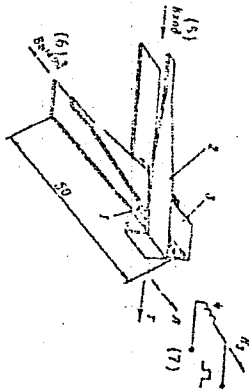


Figure 1. Design of the microwave switch: (1) ferromagnetic film; (2) input circuit; (3) output circuit; (4) control winding; (5) input; (6) output; (7) L.

The design of the switch is shown in Figure 1. The basis of the switch is a thin ferromagnetic film 1, obtained by spraying permalloy on a nonmagnetic base in a vacuum. The central longitudinal and transverse axes (axes of easy and difficult magnetization) in Figure 1 are designated as L and T, respectively. The input circuit 2 and the output circuit 3 are orthogonally arranged strip lines, shortened at the ends. The high-frequency field H_1 created by the input strip line coincides with the direction of the central longitudinal axis of the film, and

1/2 006 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--PRODUCTION OF HIGH YIELD SEMICHEMICAL PULPS FOR CORRUGATED PRODUCTS
-U-
AUTHOR--(05)-SHAPIRO, A.R., SHTOFENMAKHER, N.A., ONOKHIN, I.P., PUZYREV,
S.A., TSAL, TS.K.
COUNTRY OF INFO--USSR
SOURCE--ZELLST. PAPIER (LEIPZIG) 1970, 19(4), 107-8
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS, BEHAVIORAL AND SOCIAL SCIENCES
TOPIC TAGS--PAPER PRODUCT, INDUSTRIAL PRODUCTION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--3008/1349 STEP NO--GE/0091/70/019/004/0107/0108
CIRC ACCESSION NO--AP0138359
UNCLASSIFIED

2/2 006
CIRC ACCESSION NO--AP0138359
ABSTRACT/EXTRACT--(U) GP-0-
WAS DISCUSSED WITH RESPECT
VNIIB, LENINGRAD, USSR.

UNCLASSIFIED

PROCESSING DATE--04DEC70

ABSTRACT. A LECTURE WITH NO REFS. THE TOPIC
TO THE "PTK" PROCESS.
FACILITY:

UNCLASSIFIED

USSR

UDC: 621.373.531.3(088.8)

KONRADI, L. G., DMITRIYEV, V. A., PUZYREVICH, Yu. S.

"A Sawtooth Voltage Generator"

USSR Author's Certificate No 256832, filed 28 Mar 69, published 2 Jul 70
(from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1C280 P)

Translation: This Author's Certificate introduces a sawtooth voltage generator which contains a transistorized flip-flop and two resistance-capacitance charging networks. For separate regulation of the durations of sawtooth voltage pulses and the pauses between them, the outputs of the resistance-capacitance networks are connected through semiconductor switching diodes to the inputs of the flip-flop, and through separative semiconductor diodes to the collectors of the flip-flop transistors.

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1/2 006 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--PROPERTIES OF HIGH SILICA PORTLAND CEMENTS UNDER VARIOUS HARDENING
CONDITIONS -U-
AUTHOR--(03)--CHEBUKOV, M.F., KOKNAYEV, N.F., PYACHEV, V.A.,
COUNTRY OF INFO--USSR
SOURCE--TSEMENT 1970, (1), 18-20
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS
TOPIC TAGS--CEMENT, SILICA, CALCIUM OXIDE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--2000/1693 STEP NO--UR/0101/70/000/001/0018/0020
CIRC ACCESSION NO--AP0125314
UNCLASSIFIED

2/2 006

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NU--AP0125314

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE USE POSSIBILITIES OF THE TITLE CEMENTS WERE INVESTIGATED ON THE BASIS OF A STUDY OF THE PHYS. MECH. PROPERTIES OF HIGH SI CEMENTS (LIME SATN. COEFF. 0.78-0.91, FREE CAO 2.06-3.58PERCENT). WITH STEAM CURING (3 HR AT 100DEGREES), AFTER 90 DAYS, SOME CEMENTS WITH LIME SATN. COEFFS. LARGER THAN 0.85 HAD COMPRESSIVE STRENGTHS EXCEEDING AND BENDING STRENGTHS VIRTUALLY EQUIV. TO THOSE OF NORMAL HARDENED CEMENT. THE PROPERTIES OF THE CEMENTS ARE LARGELY GOVERNED BY THE 3CAO.SIO SUB2-2CAO.SIO SUB2 RATIO.
FACILITY: URAL. POLITEKH. INST., SVERDLOVSK, USSR.

UNCLASSIFIED

1/2 017
UNCLASSIFIED
PROCESSING DATE--20NOV70
TITLE--INFLUENCE OF STRUCTURE OF INITIAL COMPONENTS OF RADIATION CURING OF
UNSATURATED OLIGOESTERS AND OLIGOESTERURETHANES -U-
AUTHOR--(05)--CHELCHENKO, S.I., VIDENINA, N.G., MATYUSHOVA, V.G.,
CHERVETSOVA, I.N., PYANKOV, G.N.
COUNTRY OF INFO--USSR

SOURCE--IND. ENG. CHEM., PROD. RES. DEVELOP. 1970, 9(2), 143-6

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--RADIATION POLYMERIZATION, OLIGOMER, MALEIC ANHYDRIDE,
ETHYLENE, ETHYLENE GLYCOL, PHTHALIC ANHYDRIDE, ADIPIC ACID, SEBACIC
ACID, ETHYL CARBAMATE, THERMAL STABILITY, CHEMICAL RESISTANCE, POLYMER
STRUCTURE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--3002/1144

STEP NO--US/0000/70/C09/002/0143/0146

CIRC ACCESSION NO--AP0126566

UNCLASSIFIED

2/2 017

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0128566

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE IRRADN. COPOLYMN. OF UNSATD. OLIGOESTERS AND OLIGOESTER URETHANES WAS INVESTIGATED. THE UNSATD. OLIGOESTERS WERE SYNTHESIZED FROM MALEIC ANHYDRIDE, C SUB2 H SUB4, AND DIETHYLENE GLYCOL, PHTHALIC ANHYDRIDE, AND ENDOMETHYLENTETRAHYDROPHTHALIC ANHYDRIDE, ADIPIC AND SEBACIC ACIDS BEING USED AS MODIFIERS. UNSATD. OLIGOESTER URETHANES OF VARIOUS FREE ISOCYANATE GROUP CONTENTS WERE PRODUCED BY INTERACTION OF OLIGOETHYLENE, OLIGODIETHYLENE, AND OLIGETRIETHYLENE MALEATES WITH TOLYLENE, DIPHENYLMETHANE, AND HEXAMETHYLENE DIISOCYANATES. THE RELATIVE CURING RATE DEPENDS ON THE STRUCTURE OF THE OLIGOMERS, ESP. THE MONOMERS. IN THE CASE OF UNSATD. OLIGOESTER URETHANES, ISOCYANATE GROUPS PARTICIPATE IN THE CURING REACTION. IN IRRADN. COPOLYMN., BOTH THE YIELD OF INSOL. FRACTION AND CONVERSION OF DOUBLE BONDS ARE HIGHER THAN IN THE PRESENCE OF PEROXIDES. PHYS. AND MECH. PROPERTIES, THERMAL STABILITY, AND H SUB2 O AND CHEM. RESISTANCE ARE, AS A RULE, HIGHER FOR POLYMERS OBTAINED DURING HIGH ENERGY IRRADN. FACILITY: INST. HIGH MOL. CHEM., KIEV, USSR.

UNCLASSIFIED

USSR

UDC 678.5.06-419.8:66.085.3/.5

~~P.YANKOV, G. N.~~, MOROZOV, A. V., OMEL'CHENKO, S. I., KARAKCHI, A. M., BESSONOV, V.G.,
CHERVETSOVA, I. N., VIDENINA, N. G., DYACHOK, V. T., and GOLODNYI, YU. F., Institute
of Physical Chemistry imeni L. V. Pisarzhevskiy, Kiev, Academy of Sciences
Ukrainian SSR, and Institute of Chemistry of High Molecular Compounds, Kiev,
Academy of Sciences Ukrainian SSR

"Radiation Technology of Manufacturing Glass-Plastics"

Kiev, Khimicheskaya Promyshlennost' Ukrainy, No 4, 1970, pp 8-10

Abstract: Production of glass plastics using electron accelerators as radiation sources is described. The operating principle is explained with an example of the manufacture of a cylindrical sheet of cross winding. The mandrel speed, feed pitch, and dose strength are selected so that during the time of passage of the winding section across beam cross-section the required degree of polymerization of the binder is attained. The degree of polymerization between layers wound on top of each other is regulated by the energy of the impinging radiation and beam current. The source of fast charged particles in the model setup is an accelerator with maximum electron energy of 0.4 Mev. Electrons at this energy ensure radiation polymerization of a 0.2-0.3 mm layer of glass-plastics. In this layer, when the density of the current of the beam is several tens of microamperes per square centimeter, dose strength of 10^6 - 10^7 rads/sec is produced.

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USSR

UDC: 629.78.017.2

PIATAKOV, V. I.

"Concerning Vehicle Control Optimization With Regard to Restrictions on the Controlling Function and the Phase Coordinates"

Moscow, Upr. dvizhushchimisya ob'yektami. Tr. IV Vses. soveshch. po avtomat. upr. Tbilisi, 1968--sbornik (Control of Moving Objects. Works of the Fourth All-Union Conference on Automatic Control. Tbilisi, 1968--collection of papers), 1972, pp 187-200 (from RZh-Raketostroyeniye, No 10, Oct 72, abstract No 10.41.53)

Translation: The author considers the variational problem of selecting a law of variation $\alpha(t)$ which satisfies the equations of motion of the center of mass of a space vehicle in the vertical plane and ensures the required accuracy in the transition from the initial phase state to the final state with minimum fuel expenditure, i. e. it yields a minimum for the functional I without violating conditions: a) $\alpha_{\min} \leq \alpha(t) \leq \alpha_{\max}$; b) on the permissible value of the aerodynamic component of normal overload; c) on the magnitude of the velocity head; d) on the minimum flight altitude. Finding the extremum reduces to solving a boundary value problem, and success here depends

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USSR

PYATAKOV, V. I., Upr. dvizhushchimisya ob"yektami. Tr. IV Vses. soveshch. po avtomat. upr. Tbilisi, 1968--sbornik, 1972, pp 187-220

to a great extent on advantageous selection of the original initial values of the functional Lagrange factors. A method is proposed for selecting their initial values. Experimental realization of an algorithm for digital computer solution of the problem is briefly described. Bibliography of four titles. Résumé.

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USSR

UDC 617.57/.58-009.86-02:613.646

TYUKINA, A. P., Candidate of Medical Sciences, and P'YANKOV, S. M., Clinic of General Surgery, Arkhangel'sk Medical Institute

"Neurovascular Diseases of the Extremities Caused by Cold and Moisture in Workers in Some Far Northern Regions"

Moscow, Klinicheskaya Meditsina, Vol 48, No 9, Sep 70, pp 128-131

Abstract: Examination of some 2,500 fishermen, sailors, loggers, and others working in the Soviet Far North revealed a high incidence of polyneuritis and endarteritis (22 to 44 cases per 100 examined). The extent and severity of the disease varied with the length of time the individuals had been engaged in the particular work and the amount of exposure to cold and water associated with the job. Prolonged and repeated immersion in water leads at first to temporary vascular spasms in the extremities and then to almost irreversible degenerative changes in the receptors and small blood vessels supplying them. The larger vessels eventually become involved ("ascending neuritis"). Suggestions are given for the treatment and prevention of such disorders.

1/1

USSR

UDC 669.721.472

GENKIN, Ya. N., P'YANKOV, V. A.

"System for Automatic Testing of Technological Parameters of Magnesium Electrolyzers"

Tr. Vses. N.-i. i Proekt. In-ta Alyumin., Magn. i Elektrod. Prom-sti [Works of All-Union Scientific Research and Planning Institute for the Aluminum, Magnesium and Electrode Industry], No 79, 1971, pp 137-143, (Translated from Referativnyy Zhurnal, Metallurgiya, No 5, 1972, Abstract No 5 G252 by G. Svodtseva).

Translation: An installation for automatic centralized testing (ACT) of the technological process of Mg electrolysis has been developed and introduced at one magnesium plant. The ACT installation includes systems for automatic measurement and recording of the current and voltage across electrolyzers and the temperature of the electrolyte, as well as the rarefaction in the anode and cathode evacuation systems. Use of the ACT system allowed the technological modes of operation of the magnesium electrolyzers to be improved: the number of disruptions of the temperature mode was decreased by 5-7 times, overheating of electrolyzers to above 730° was reduced from the earlier figure of 20-25%, more precise and timely regulation of the electrolyzers became possible. The yield per current was increased by 2%; the specific consumption of electric power decreased by 500-600 kw·hr/t Mg.

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1/2 026
UNCLASSIFIED
TITLE--INTERACTION OF HIGH ENERGY ALPHA PARTICLES WITH NUCLEI -U-
PROCESSING DATE--09OCT70
AUTHOR--(04)--DUDKIN, V.E., PVANOV, I.I., SYSOYEVA, O.V., VIKHROV, A.I.
COUNTRY OF INFO--USSR
SOURCE--YAD. FIZ. 1970, 11(1), 36-42
DATE PUBLISHED--70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--ALPHA INTERACTION, HIGH ENERGY PARTICLE, MONTE CARLO METHOD,
ALPHA BOMBARDMENT, ALUMINUM, SILVER, NITROGEN, NIOBIUM
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1980/0172
STEP NO--UR/0367/70/011/001/0036/0042
CIRC ACCESSION NO--AP0048464
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0048464

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. INTERACTION OF 105-MEV ALPHA PARTICLES WITH PRIME17 AL AND PRIME108 AG, AND 380-MEV ALPHA PARTICLES WITH PRIME14 N, PRIME27 AL, AND PRIME93 MB WAS CALCD., BY USING THE MONTE CARLO METHOD ON THE BASIS OF CASCADE EVAPN. MODEL. COMPARISON OF THE CALCD. RESULTS WITH THE EXPTL. DATA SHOWS THAT THE MODEL USED PERMITS A REASONABLE DESCRIPTION OF THE GENERAL CHARACTERISTICS OF THE INTERACTION.

FACILITY: INST. MED.-BIOL. PROB., MOSCOW, USSR.

UNCLASSIFIED

1/2 018
TITLE--SYMPTOMATIC EPILEPSY, MULTIPLE INTRACRANIAL ANEURYSMS, FOCAL
NECROSIS OF THE BRAIN WITH OSSIFICATION -U-
AUTHOR--PYANOV, R.P.
COUNTRY OF INFO--USSR
SOURCE--ARKH PATOL 32(3): 76-80. ILLUS. 1970.
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--EPILEPSY, AUTOPSY, ANEURYSM
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY FICHE NO----FD70/605015/B06 STEP NO--UR/9056/70/032/003/0076/0080
CIRC ACCESSION NO--AP0140549
UNCLASSIFIED

2/2 018
CIRC ACCESSION NO--AP0140549
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--04DEC70

ABSTRACT. CHANGE OF PERSONALITY AND DEMENTIA WERE NOTED IN 2 CASES. AUTOPSY FINDINGS IN A WOMAN 37 YR OF AGE WHO WAS SUFFERING FROM EPILEPTIC FITS FROM THE AGE OF 16 WERE: SACULAR ANEURYSM OF THE RIGHT VERTEBRAL ARTERY, WHICH COMPRESSED THE MEDULLA OBLONGATA, AND ANEURYSM OF THE LEFT MEDIAN CEREBRAL ARTERY (WHICH WAS SPONTANEOUSLY CURED). BOTH OF THESE ANEURYSMS WERE PROBABLY CONGENITAL. A LARGE FOCAL NECROSIS IN THE LEFT CEREBRAL HEMISPHERE WITH HETEROTOPIC BONE FORMATION IN THE CAPSULE OF THE FOCUS OF OBSCURE ORIGIN, WAS REVEALED AT AUTOPSY IN A 42 YR OLD MAN, WHO HAD HAD EPILEPTIC FITS FROM THE AGE OF 28.

UNCLASSIFIED

USSR

UDC 621.317.7.083.4

KARTASHOV, R. P., P'YANYKH, B. Ye., GOLUBEV, V. V.

"Magnetic Current Null-Balance Device"

USSR Author's Certificate No 284035, Filed 4/01/70, Published 22/01/71,
(Translated from Referativnyy Zhurnal Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 11, 1971, Abstract No 11 A134 F from the Resume).

Translation: A magnetic current null-balance device is suggested which contains an unbalanced trigger and a transformer based on a core with a rectangular hysteresis loop, with windings displacing the measured signal and output windings. In order to increase the sensitivity, the output windings of the transformer are connected to the input of the unbalanced trigger, the outputs of which are connected to the bias windings. 3 Figures.

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USSR

UDC: 538.56:621.372.8

VLASOV, B. I., KOTOSONOV, N. V., DRONOVA, V. S., PIYANKH, YU. M., Voronezh State University

"Using Metal-Semiconductor Film Structures to Study the Diffraction Fields of Plane Nonhomogeneities in a Waveguide"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy: Radiofizika, Vol 13, No 10, 1970, pp 1532-1540

Abstract: The authors solve the problem of type H_0 1 wave diffraction in a rectangular waveguide by a central inductive strip and a metal-semiconductor thin film. It is shown that the diffraction field of the inductive strip is not significantly distorted by introducing a matched multilayered structure. Deviation of the temperature relief patterns from the law of distribution of the induced currents in the absorbing film because of spreading of the thermal field decreases with an increase in the parameter $k = 2\pi/\lambda$ and in the modulation frequency F . A theoretical and experimental basis is given for the possibility of utilizing the distributed matched load method (N. V. Kotosonov, B. I. Vlasov, IYUZ Radiofizika, Vol 11, No 2, p 311 [1968]) with metal-semiconductor thin films for studying diffraction fields in a waveguide.

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USSR

UDC 581.132.8

VOSKRESENSKAYA, N. P.; VIYL', Yu. A.; GRISHINA, G. S.; PYARNIK, T. P.; Institute of Plant Physiology imeni K. A. Timiryazev, Academy of Sciences USSR, and Institute of Experimental Biology, Academy of Sciences Estonian SSR, Kharku

"Distribution of Tracer Carbon in Products of the Photosynthesis in Bean Plant Leaves in Red and Blue Light Depending on the Content of Oxygen in the Medium"

Moscow, Fiziologiya Rasteniy, Vol 18, No 3, May/Jun 71, pp 488-493

Abstract: The intensity of photosynthesis and $C^{14}O_2$ metabolism were studied in experiments on bean plant (*Phaseolus* sp.) leaves in which discs from the leaves were exposed to $C^{14}O_2$ in red or blue light in air and N_2 . In air on the light plateau, the intensity of photosynthesis was the same in red and blue light. It was increased in either kind of light in N_2 , but to a greater extent in blue than red light. In air blue light activated incorporation of C^{14} into glycine, serine, alanine, aspartic acid, and glutamic acid, while inhibiting its inclusion, as

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USSR

VOSKRESENSKAYA, N. P., et al, Fiziologiya Rasteniy, Vol 18, No 3, May/Jun 71, pp 488-493

compared with red light, into starch. In N_2 in either kind of light there was a change in the principal path by which C left the Calvin cycle; the way over phosphoglyceric acid was activated (particularly in red light), while that over glycolate was inhibited. The activating effect of blue light on the inclusion of C^{14} into the amino acids mentioned above was retained in N_2 , being increased greatly in the case of serine. Furthermore, blue light had an activating effect in N_2 on the incorporation of C^{14} into phenylalanine, while reducing greatly, vs. red light, the incorporation of C^{14} into alanine. The inhibiting effect of blue light on the biosynthesis of starch disappeared in N_2 . While O_2 had only a small effect on the activation of the biosynthesis of amino acids by blue light, it enhanced greatly the inhibiting effect of this light on the synthesis of starch. The reasons for the latter phenomenon are not quite clear.

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USSR

UDC 66.085.3/.5:678.742.2

P. YANKOV, G. N., KABAKCHI, A. N., GOLODNIY, YU. F., BRASHKIN, M. A., IOPATIN, I. P., KARILLO, YE. G., and BORDIKOVA, A. N., Institute of Physical Chemistry, Acad. Sc. UkrSSR

"Experimental Line for the Production of Radiation Modified Polyethylene Tubes UR-0.4T"

Kiev, Khimicheskaya Tekhnologiya, No 2 (62), Mar-Apr 72, pp 50-52

Abstract: An experimental line has been constructed for the production of radiation modified polyethylene tubes. The novelty of this process is in the irradiation method. The tubes pass repeatedly through the irradiation zone in a spiral pattern, with alternating directions of the rotation, so that exposure is uniform to the radioactive source, and damage due to the radiation heat is minimal. As an example, a tube 6 mm in diameter, wall thickness up to 0.5 mm, moving at a velocity of 2m/min, after 6 passages through the chamber picks up a dose of 45 Mrads.

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Hydraulic and Hydrostatic

USSR

UDC: 551.46.086

FEL'DMAN, A. Ye., KUMAN, V. V., KROTOV, V. A., PYANTKOVSKAYA, E. P.
"A Device for Measuring Wind Parameters From on Board a Moving Ship"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obrabotsy, Tovarnyye Znaki,
No 6, Feb 72, Author's Certificate No 328390, Division G, filed 28 Jul 69,
published 2 Feb 72, p 137

Translation: This Author's Certificate introduces: 1. A device for measuring wind parameters from on board a moving ship. The device contains a wind gauge connected to a device for converting wind speed and direction to angle of turn. The conversion device is connected to a vector plotter. The measurement device also contains instruments which relay the ship's course and velocity. As a distinguishing feature of the patent, the device is designed for vector averaging of the true wind speed and direction. For this purpose it is equipped with two averaging blocks, each of which is made in the form of an integrating drive connected through an electromagnetic clutch to a linearly rotating transformer and a device for resetting readings to zero. The device is also equipped with programming and commutating devices. The averaging blocks are connected between the output

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USSR

FEL'DMAN, A. Ye. et al., USSR Author's Certificate No 328390

circuits of the sine-cosine rotating transformer of the central instrument and the vector plotting inputs. The power supply for the electromagnetic clutches is connected through the commutating device, which is controlled by the programming device. The output circuits of the sine-cosine rotating transformer of the central instrument are connected to the inputs of the integrating drives through controlled phasing devices. Connected between the outputs of the linearly rotating transformers of the averaging blocks and the inputs of the sine-cosine rotating transformer in the vector plotter are scaling rotating transformers and resistance-controlled transformers. 2. A modification of this device distinguished by the fact that provision is made for storage of the average vector values found for the wind parameters and for relaying these parameters in the next averaging period. The power supply for the elements of the vector plotter and the linearly rotating transformer of the averaging block is connected through the commutating device controlled by the programming device. The programming device actuates the commutating device at the end of the averaging period before reset of the readings on the averaging block.

2/2

- 115 -

P'YANZINA, L. Ya.

96. USSR

PETROV, A. A. and P'YANZINA, L. Ya.

UDC 611--0.8.82 : 519.92+519.95

SO: FOREIGN PRESS DIGEST

29 OCT 1971

"Elements of a Mathematical Theory of Neurons and Neuron Networks"
Kiberneticheskiye Aspekty v Izuchenii Raboty Mozga (Cybernetic Aspects of the Study of the Brain's Functioning), Moscow, Nauka Publishing House, 1970, pp 223-230

Abstract: The goal of the present work is to construct a mathematical model of a nerve cell, distinguished by a minimal number of characteristics selected for the description of the information properties of a biological neuron. This makes the model more simple than other well-known mathematical models and therefore suitable for analytical description of the functioning of simple neural networks.

Mathematical expressions were obtained which represent the processes whereby a continuous input action is converted by the neuron (receptor) into an impulse code and the impulse code is converted by the neuron's synapses into a continuous post-synaptic potential.

The relationships connecting the frequency of excitation of the neuron with the parameters of the input action (which is continuous for the receptor and pulsed for

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29 Oct 71

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PPD:CYBERNETICS

USSR

PETROV, A. A., P'YANZINA, L. Ya., Kiberneticheskiye Aspekty v Izuchenii Raboty Mozga, Nauka Publishing House, 1970, pp 223-230

the neuron's synapse) and with the characteristics of the neuron (receptor) were found.

The coincidence of the theoretical results with the quantitative data from neurophysiological experiments is used as the criterion of adequacy of the model.

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USSR

UDC 510

PYASKOVSKYY, B. V.

"Some Gnoseological Questions in Cybernetics"

Filos. probl. suchasn. pryrodozn. Mizhvid. nauk. zb. (Philosophical Problems in Modern Natural Science. Interdepartmental Collection of Scientific Works), 1971, vyp. 24, pp 131-137 (Ukrainian; Russian summary) (from RZh-Matematika, No 2, Feb 72, Abstract No 2A1 from author's summary)

Translation: Some gnoseological questions in cybernetics are analyzed -- the essence of the subject of cybernetics, the possibility of creating a "living" organism and brain, entropy, etc. A criticism is given of idealistic and metaphysical views on these questions.

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USSR

UDC 615.38.014.4

DUDKO, N. Ye., Professor, DASHKEVICH, V. P., ZVERKOVA, A. S., and PYASTA, A. N.,
Kiev Institute of Hematology and Blood Transfusion

"Some Data from Studies of Blood Preserved with TsOLIPK-13 Solution for Different
Periods of Storage"

Moscow, Problemy Gematologii i Perelivaniya Krovi, No 3, 1970, pp 18-20

Abstract: A study was made of morphological and biochemical changes, serological properties and therapeutic effectiveness of blood preserved at high dilution (1:1) with TsOLIPK-13 solution. Indices measured included the amount of erythrocytes and leukocytes, hemoglobin, latent hemolysis, blood pH resistance of erythrocytes and their morphological changes, and blood inorganic phosphorus and sugar content. Tests were conducted on the day the blood was taken, and then on every sixth day until the 30th day of preservation. Twenty series of experiments were conducted, and in all series the results were similar. Serological characteristics of blood stored at 4-6°C were investigated every fifth day. Study of erythrocyte morphological changes showed that erythrocytes almost completely lose the ability to form rouleaux on the sixth storage day. However, the first spherocytes appear only on the 18th day of storage, and on the 30th day comprise 18-29%. Shift in the osmotic resistance of erythrocytes in blood preserved with citric acid occurred, mainly,

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DUDKO, N. Ye., et al., Problemy Gematologii i Perelivaniya Krovi, No 3, 1970, pp 18-20

because of minimal resistance. In all series of experiments, the minimal resistance decreased on an average from 0.7 on the day the blood was taken to 0.85 on the 30th day of storage. Traces of latent hemolysis were detected on the 18th day of storage, and by the 30th day hemolysis did not exceed 0.65-0.75%. There were two exceptions where hemolysis on the 30th day was higher than 1%. Blood sugar content gradually decreased during the 30 days of storage. During the first 18 days, this decrease was more intensive than in the latter days. Analysis of inorganic phosphorus content in the blood revealed a gradual 3.5-fold increase with the passage of storage time. This was analogous to blood stored with other preservatives. Results of serological investigations showed that erythrocytes containing antigen A lowered their agglutination activity by the 30th day. The agglutinability of erythrocytes containing agglutinin B dropped much more sharply. A significant decrease in agglutination activity was also noted in erythrocytes containing antigens M and N. Patients of different ages and different medical problems received blood transfusions of this preserved blood at varying intervals, and in various amounts. The blood storage time varied from 8 to 35 days. A therapeutic effect was observed in all patients. There was an improvement in the general condition, increase in hemoglobin content and number of erythrocytes, and cessation of hemorrhage. It was especially effective in cases of third and fourth degree traumatic shock.

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USSR

UDC 622.243.27

PYATA, S. Ya.

"Calculation of a Nomogram for Determination of Corrections for Course Drift of a Gyroscope During Inclinometry of Boreholes"

Moscow, Razvedka i Okhrana Nedr, No 8, 1972, pp 48-50.

Abstract: Gyroscopic devices are widely used to measure the inclinations of boreholes. The gyroscopes used in these devices are subject to drift which can be calculated. This article presents a method for composition of nomograms which can be used to determine the angular error of borehole inclinometry resulting from gyroscope drift. The analytic and graphic dependences produced, relating the course angle of the gyroscope to the rate of the lifting and lowering of the inclinometer, measurement time and borehole depth, can be considered in developing devices for immediate determination of corrections for gyroscope drift during inclinometry of boreholes with variable vertical scale and descent indication.

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USSR

UDC 533.951.8

PYATAK, A. I., SIZONENKO, V. L., and STEPANOV, K. N.

"Nonpotential Instabilities of Plasmas With Transverse Current, Part 1"
Leningrad, Zhurnal Tekhnicheskoy Fiziki, No 3, 1973, pp 475-482

Abstract: Plasmas with a current flowing at right angles to the external magnetic field are unstable with respect to the oscillation of high-frequency, small-scale instabilities with frequency and increments of build-up higher than the ion cyclotron frequency. This paper discusses the excitation of short-wave, nonpotential oscillations in such a plasma. It is assumed that the frequencies and increments of build-up of the oscillations are higher than the ion cyclotron frequency and are much lower than the electron cyclotron frequency, while the transverse wavelength is assumed much shorter than the Larmor ion radius. The effect of the magnetic field on the ions during the development of the instabilities can then be neglected. The further assumption is made that the transverse wavelength is much less than the characteristic dimensions of the nonuniformity of density and the magnetic field, which condition permits a local approximation of the problem. Hydrodynamic and hot-ion instabilities in the plasma are also investigated. The authors express their gratitude to A. B. Mikhaylovskiy for his critique and advice.

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USSR

UDC 533.951.8

PYATAK, A. I., SIZONENKO, V. L., and STEPANOV, K. N.

"Nonpotential Instabilities of Plasmas With Transverse Current, Part 2"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, No 3, 1973, pp 483-488

Abstract: This article is the second part of a paper begun in the same issue of the same journal named above (pp 475-482). This second part is concerned with short-wave, nonpotential instabilities in a plasma with a transverse current and considers the excitation of nonpotential oscillations in a non-isothermal plasma with hot electrons and cold ions as well as similar situations in an isothermal plasma. It is shown that if the electron temperature is much higher than the ion temperature, long-wave electromagnetic oscillations with a phase velocity of the order of the electron thermal velocity along the magnetic field may be generated in addition to short-wave ionic-sonic oscillations. The instabilities in a plasma whose electron temperature substantially exceeds the ion temperature are investigated, as well as those in a plasma of equal electron and ion temperatures. The authors note that the unstable oscillations excited by resonance particles also are important factors in heating the plasma electrons and ions.

1/1

Waveguides

USSR

UDC: 621.372.852.1

PYATAK, M. I., KOROBKIN, V. O.

"Experimental Study of Electrically Tuned Microwave Filters Based on a Periodic Ferrite Structure"

Visnyk Kharkiv. un-tu (Khar'kov University Herald), 1972, No 80, Radio Physics and Electronics, vyp. 1, pp 54-58 (from RZh-Radiotekhnika, No 8, Aug 72, Abstract No 8B179)

Translation: An investigation was made of the properties and parameters of filters based on periodic ferrite structures controlled by an external magnetic field for the purpose of optimizing the parameters of the structure (thickness of the ferrite elements, the ratio between the lengths of the empty and ferrite-filled parts of the period, the parameters of the material). The advantages of filters of this type over others are noted: the low intensity of the controlling field (less than 1000 oersteds), and the broad tuning range. They have significant possibilities for use in the millimeter band. Three illustrations, bibliography of seven titles. N. S.

1/1

USSR

UDC: 621.372.852.15

KOROBKIN, V. A., ~~PYATAK, N. I.~~ Khar'kov "Order of the Red Banner of Labor"
State University imeni A. M. Gor'kiy

"An Electrically Controllable Microwave Filter"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki,
No 12, Apr 72, Author's Certificate No 310602, Division H, filed 25 Dec 69,
published 30 Mar 72, p 241

Translation: This Author's Certificate introduces an electrically con-
trollable microwave filter which contains a rectangular waveguide, a ferrite
insert and a magnetic system. As a distinguishing feature of the patent,
the controlling magnetic field strength is reduced by making the ferrite
insert in the form of identical ferrite elements located along the axis of
the waveguide with equal spacing to form a periodic structure partially
filling the cross section of the waveguide.

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USSR

UDC: 621.372.852.4

KOROBKIN, V. A., PYATAK, N. I., MEKHED'KIN, A. A., Khar'kov "Order of the Red Banner of Labor" State University imeni A. M. Gor'kiy

"An Electrically Controlled Waveguide Polarizer"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obratzsy, Tovarnyye Znaki, No 12, Apr 72, Author's Certificate No 310601, Division H, filed 5 Jan 70, published 30 Mar 72, p 241

Translation: This Author's Certificate introduces an electrically controlled waveguide polarizer consisting of a section of circular waveguide with a ferrite insert installed on its axis in a controlling external longitudinal magnetic field. As a distinguishing feature of the patent, the polarizer is designed for converting a linearly polarized wave to right- or left-hand circularly polarized waves in a wide frequency band, and for reducing the external magnetic field strength. The above-mentioned insert is made in the form of coaxial ferrite cylinders separated by an air space.

1/1

USSR

PYATAKOV, V. I.

"Optimization of Control of a Flight Vehicle (FV) Considering Limitations on Control Function and Phase Coordinates"

Upr. Dvizhushchimisya Ob'yektami. Tr. IV Vses. Soveshch. po Avtomat. upr. Tbilisi, 1968 [Control of Moving Objects, Works of Fourth All-Union Conference on Automatic Control, Tbilisi, 1968 -- Collection of Works], Moscow, 1972, pp 187-200, (Translated from Referativnyy Zhurnal, Mekhanika, No 10, 1972, Abstract No 10 A46, author's view).

Translation: A study is presented of the variational problem of selecting a rule of change $\alpha(t)$, satisfying the equations of motion of the center of mass of a flight vehicle in the vertical plane and providing for transition of the vehicle from the initial phase state to a fixed final state with required accuracy with minimum fuel consumption, i.e., achieving the minimum of functional I without violating the limitations: a) $\alpha_{\min} \leq \alpha(t) \leq \alpha_{\max}$; b) limitation of permissible aerodynamic component of normal load; c) limitation of velocity head; d) limitation of minimum flight altitude; determination of the extreme is reduced to solution of the boundary problem, the success of which depends to a great extent on successful selection

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USSR

PYATAKOV, V. I., Upr. Dvizhushchimisya Ob'yektami. Tr. IV Vses. Soveshch. po Avtomat. upr. Tbilisi, 1968, Moscow, 1972, pp 187-200.

of initial values of functional Lagrange factors. A method is suggested for selecting their initial values. An experiment in producing an algorithm for numerical solution of the problem on a digital computer is briefly described.

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USSR

Mechanical Properties

UDC 669.15-194:669.14

NIKITSKAYA, V. A., PYATAKOVA, L. L., POLTAVETS, N. A.,
SHUBINA, S. A., KUZNETSOVA, L. M., VOLKOV, L. G., BARANOV, V. Ya.,
and CHEREDNIK, L. Ye., Metallurgical Plant imeni Dzerzhinskiy,
Dneprodzerzhinsk Industrial Institute imeni M. I. Arsenichev

"Improvement of Mechanical Properties of Hot-Rolled LOKhsND Steel"
Moscow, Metallurg, No 1, Jan 73, pp 16-17

Abstract: Experimental data are presented on the effects of chemical composition, method of final deoxidation, and temperature at the end of rolling on the level of mechanical properties and the amount of waste of LOKhsND steel in the hot-rolled state. The effects of C, Mn, Si, and Cr and their summary effect on the impact strength and the ultimate strength (yield) of LOKhsND steel deoxidized in the ladle with aluminum (1000 g/ton) and ferro-titanium (500 g/ton) are discussed by reference to diagrams. Best results in improving the mechanical properties and in decreasing the amount of waste were obtained by applying calciosilicate (2000 g/ton) and by reducing the rolling temperature to 900 °C at the same time. The use of calciosilicate in the final deoxidation of steel in the open-hearth shop of the Plant imeni Dzerzhinskiy decreased the amount of waste by 5-5.5 times. Two figures, one table.

1/1

USSR

PYATENKO, T. G., KIRILYUK. N. I.

"Analysis of Initial Data for an Automated Enterprise Control System"

Kibernet. i Vychisl. Tekhn. Resp. Mezhd. Sb. [Cybernetics and Computer Technology. Republic Interdepartmental Collection], 1971, No 12, pp 70-78 (Translated from Referativnyy Zhurnal Kibernetika, No 4, 1973, Abstract No 4V666, by the authors).

Translation: A method is suggested for classification and description of a production system; a specific list of objects is presented, making up the basis for the information to be utilized in an enterprise ACS.

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USSR

UDC 611-018.46-018.13-086.2

PYATKIN, Ye. K., SUSKOV, I. I., and PETROVA, S. A., Institute of Biophysics, Moscow

"The Dependence of the Type and Frequency of Chromosome Aberration Induced by Gamma Rays in Human Bone Marrow Cells During Local Irradiation on the Method of Hypertonic Processing"

Moscow, Laboratornoye Delo, No 1, 1973, pp 6-8

Abstract: Bone marrow samples were collected from the iliac bone and the sternum of patients 24 hrs after a single therapeutic irradiation with 100, 200, 277, and 300 rad of Co^{60} gamma rays. The samples, containing at least 4 million cells, were suspended in medium No 199, incubated at 37°C for 1 hr, resuspended, divided into two equal portions, and centrifuged. The supernatant fluid was removed, and 7 ml of a warm 0.5% KCl solution added to one portion, while an equal volume of Hanks' solution diluted with distilled water (1:3) was added to the other portion. The cells were left in the hypotonic solutions for 10-15 min and then fixed and stained. In bone marrow cells treated with hypotonic KCl, the observed proportion of metaphases suitable for analysis was 60-70%, and a considerably larger number of aberrant cells, chromatide type aberrations (chromatid fragments and exchanges), and $1/2$

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USSR

PYATKIN, Ye. K., et al, Laboratornoye Delo, No 1, 1973, pp 6-8

paired fragments were observed than after treatment with diluted Hanks' solution (only 30-40% of metaphases suitable for analysis), though no significant difference was detected in the frequency of chromosome-type aberration (dicentrics and rings). The average frequency of chromatid fragments and exchanges per aberrant cell after treatment with KCl was more than twice as high as after treatment with Hanks' solution. Thus, in the latter case, a large number of aberrant metaphases, especially those with chromatid type aberrations, become unsuitable for cytological analysis.

2/2

USSR

UDC 616-001.34-07:616.831-005-073.73

OSTAPENKO, O. I., and PYATAKOVICH, F. A., Regional Clinical Hospital No 1;
Pedagogical Institute, Kemerovo

"The State of Cerebral Hemodynamics in Patients With Vibration Sickness
According to Rhenoencephalographic Data"

Moscow, Gigiyena Truda i Professial'nyye Zabolevaniya, No 2, 1972, pp 52-53

Abstract: The visual and quantitative analysis of data collected from patients with first, second, and clinical state of the disease indicated that all of them suffered with asymmetry of the cerebral hemispheres. This was evident from difference in the REG of the right and left carotid arteries, as well as from the time-related quantitative REG indicators of both hemispheres. All patients showed a decreased rheographic index, increased a interval, and a decreased inclination angle of the ascending section of the curve (V_{max}) in comparison with control group (healthy individuals). Distortions in the configuration of REG curves indicated a decrease in the tonus of intracerebral vessels at the bases of both carotid arteries. A decrease of the rheographic index indicated that the volumetric fluctuations in the blood flow decreased. Changes related to the tonus of brain vessels were most visible within the F-F region of rheoencephalograph, which reflect the blood supply of the brain

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USSR

OSTAPENKO, O. I., and PYATAKOVICH, F. A., Gigiyena Truda i Professional'nyye Zabolevaniya, No 2, 1972, pp 52-53

front artery. This was manifested by frequent localized headaches in majority of patients. In about 40% of patients a decrease in the tonus of the vertebro-basilar system was observed. According to REG data structural changes in the blood vessel walls occurred as a result of work with vibrating mining machinery for many years (3-21 years).

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USSR

UDC 616.28-02:613.644

PYATAYEV, G. Ye., The Ust'-Kamenogorskiy Extension of the Institute of Regional Pathology, Ministry of Health Kazakh SSR

"Effects of Powerful Intermittent Noise on the Functional State of the Auditory Analysor"

Moscow, Vestnik Otorinolaringologii, No 5, Sep/Oct 71, pp 31-36

Abstract: Auditory acuity was investigated in 121 workers aged 20-49 who had been working with detonation gases for 0-10 years. In most of them, the hearing threshold was elevated by 5-85 decibels in the frequency of 3,000-8,000 Hz; in some, threshold elevation was also observed in the medium frequency range to both air and bone conduction. Discrimination of whisper speech was impaired in all subjects. In the youngest workers (beginners), auditory acuity deteriorated by up to 35 decibels within 6-8 months on job. The condition was exacerbated with an increasing number of years on job. Antiphonic earmuffs exerted protective effects by blocking sound waves and air blast waves. Otoscopy revealed essentially no pathology. Investigation of sound loudness equalization suggested that pathology was located in the hair cells of the organ of Corti in most individuals and in the cochlear ganglion in some of them. Changes in the functional state of the auditory cortex were apparent in all subjects.

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PYATETSKIY, V. Ye.

PART I. HYDROMECHANICS AND BIOENERGETICS

TPAS 55982
15 May 72

KINEMATICS AND HYDRODYNAMICS OF SWIMMING OF BLACK SEA CARPISH
Article by V. Ye. Pyatetskiy and V. P. Kaban. Kiev, Kiev, Biomechanics, Russian,
No 5, 1971, 122-130 (English transl., pp 5-11)

A study of the kinematic and hydrodynamic characteristics of rapidly swimming marine animals for the use of those data in different technical applications is an important direction in hydrobiologic investigations.

Investigations of the kinematics and hydrodynamics of the swimming of Black Sea Garfish (Balona balone auring) were made in the summer of 1968 in the Karadagskoye Division of the Institute of Biology of the Southern Seas Ukrainian Academy of Sciences on an apparatus specially designed for biodynamic studies at the Hydromechanics Institute Ukrainian Academy of Sciences (1). This study is a methodological continuation of investigations of the kinematics and hydrodynamics of swimming of other species of Black Sea fish made earlier at the Institute (2,3). The principal dimensions (L -- length, H -- height, B -- width, given in Table 1.

The Garfish were investigated during reversed motion on the basis of their optomotor reactions. In this method motion can increase in the velocity of the oncoming flow the fish strive to maintain their former position relative to fixed reference points. In this case the reference point was a coordinate grid plotted on the bottom of the working chamber of the biodynamic apparatus (grid square measuring 100 x 100 mm, line thickness 0.5 mm). The upper and side walls of the chamber were made of plastic. This made it possible to carry out observations of a fish in the reversed flow, being fixed relative to swimming of the fish. The working chamber, being fixed relative to the observation, was 300 x 300 mm. The velocity of the oncoming flow at each point in the cross section of the working chamber of the

PYATETSKIY, V. Ye.

PART VI. EXPERIMENTAL METHODS

BIOHYDRODYNAMIC APPARATUS OF THE CLOSED TYPE FOR STUDYING THE HYDRODYNAMICS OF SWIMMING OF MARINE ANIMALS

[Article by V. L. Kargin and V. Ye. Pyatetsky, Kiev, Kiev, Biomechanics, Russian, No 5, 1971, Issued "Naukova Dumka", pp 121-124]

JPRS 55482

15 May 72

A biohydrodynamic apparatus of the closed type designed and constructed in 1969 at the Hydromechanics Institute Academy of Sciences Ukrainian SSR is intended for conducting experimental investigations for determining resistance, speed, and other kinematic and hydrodynamic characteristics of the swimming of different fish and other aquatic animals with a longish body. The apparatus makes it possible to study the swimming characteristics of different mechanical models during reversed motion. The design of the apparatus makes it possible to register simultaneously in two mutually perpendicular planes, and the limiting swimming speeds and the greatest time of swimming at a stipulated speed, and also during the course of swimming at fish swimming at different speeds.

The basis for the method for conducting investigations for determining the kinematics of swimming of fish is the principle using unconditioned visual-motor (optomotor) reactions of fish. Biologists have long known that the individual mechanisms of visual perception of animals are associated with their motor reaction. The optomotor reactions of fish after a variety of optokinetic nystagmus, that is, an involuntary movement of the eyes, head or entire body of the fish after visible landmarks moving in its field of view. In such a case one of these landmarks is a coordinate grid plotted in black paint on the bottom of the working part of a biohydrodynamic tube. Accordingly, in the reversed flow the investigated object seemingly "stands" in place relative to a fixed observer and the elements of kinematics of swimming of the fish are reliably registered on the motion picture film.

USSR

UDC: 8.74

VASIL'YEV, A. V., PYATETSKIY-SHAPIRO, I. I., RADVOGIN, Yu. B., Institute of Applied Mathematics, Academy of Sciences of the USSR

"Modeling Processes of Sorting, Invasion and Aggregation of Cells"

Moscow, Modelirovaniye protsessov sortirovki, invazii i aggregatsii kletok (cf. English above), 1972, 49 pp, ill. bibl. 11 titles (manuscript deposited in VINITI 16 Nov 72, No 5087-72 Dep.) (from RZh-Kibernetika, No 7, Jul 73, abstract No 7V673 Dep. by the authors)

Translation: An investigation is made into the local mechanisms responsible for sorting, invasion and aggregation of cells. It was found that 10-24 bonds per cell is sufficient for sorting of aggregates whose dimensions are comparable with actual sizes. It is shown that each cell is displaced by 3-5 cellular diameters on the average in the sorting process. For modeling of invasion it is shown that each cell must be bound to 2-3 layers of neighboring cells.

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USSR

UDC 513.6

PYATETSKIY-SHAPIRO, I. I. and SHAFAREVICH, I. R.

"Torelli Theorem for K3-Type Algebraic Surfaces"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Matematicheskaya, Vol 35, No 3,
May-Jun 71, pp 530-572

Abstract: This article proves that a K3-type algebraic surface is uniquely determined by the representation of integrals of its own holomorphic differential form according to the base loops of a two-dimensional group of homologies, if the class of homologies of hyperplanar cross sections is extracted. The authors are concerned with algebraic surfaces with a zero canonical class. In this article they study only those surfaces which are determined over a field of complex numbers. Two classes of these surfaces exist, one comprises two-dimensional abelian sets, and the surfaces of the other type are simply-connected. However, both are termed K3 types. After stating the problem and giving the basic results, the authors proceed to a description of families of type K3 plotted surfaces using a theorem for this purpose. They then state another theorem for bunches of elliptical curves on type K3 surfaces along with the proof thereof. The next section is devoted to special Kummer surfaces, the findings in which are supported by detailed equations and one drawing.

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USSR

PYATETSKIY-SHAPIRO, I. I., et al, Izvestiya Akademii Nauk SSSR, Vol 35, No 3,
May-Jun 71, pp 530-572

Then a description is given of the Torelli theorem as concerns these special Kummer surfaces with an appendix wherein the topology of the Kummer surfaces is discussed with concomitant lemmas and proofs. Proof of the Torelli theorem is completed in the next section, accompanied by a supplement of known facts concerning even unimodular lattices for the readers' convenience and ease of comprehension. Finally the authors discuss automorphism and singular surfaces, supported by detailed equations and arguments. The article contains one figure and a bibliography of 20 titles.

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014

UNCLASSIFIED

PROCESSING DATE--30OCT70
-U-

TITLE--CERTAIN MATHEMATICAL PROBLEMS CONNECTED WITH MORPHOGENESIS
AUTHOR--(03)--LEONTOVICH, A.M., PYATELSKIYSHAPIRO, I.I., STAVSKAYA, O.N.

COUNTRY OF INFO--USSR

SOURCE--AVTOMATIKA I TELEMEXHANIKA, 1970, NR 4, PP 94-107
DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--COMPUTER APPLICATION, MATHEMATIC MODEL, CYTOLOGY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1996/1726

CIRC ACCESSION NO--AP0118704

STEP NO--UR/0103/70/000/004/0094/0107

UNCLASSIFIED

2/2 014

CIRC ACCESSION NO--AP0118704
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--30OCT70

ABSTRACT. THERE HAVE BEEN CONSIDERED
GEOMETRICAL PATTERNS OF MORPHOGENETIC MOVEMENTS WITHOUT TOUCHING UPON
THE PHYSICAL CHEMICAL NATURE OF THE FORCES WHICH INDUCE THESE MOVEMENTS.
THE RULES OF THE MOVEMENT OF CELLS IN OUR MODELS DEPEND ONLY ON THE
POSITION OF A SMALL NUMBER OF THEIR NEIGHBOURING CELLS. THERE HAVE BEEN
INVESTIGATED PATTERNS OF THE MOVEMENTS OF A LINE CONSISTING OF CELLS ON
A PLANE. THERE HAS BEEN CHOSEN THE SIMPLEST PROBLEM, THAT OF
LINEARIZATION. THE ARTICLE PRESENTS THE RESULTS OF MODELLING ON A
COMPUTER WHICH SHOW THAT OUR RULES ENSURE THE SOLUTION OF THE PROBLEM OF
LINEARIZATION.

UNCLASSIFIED

30 Oct 70

124

USSR

Mathematics

Lomonosov, S. N.

Fizmatgiz, Moscow

UDC 62-50

"Some Mathematical Problems Connected with Navigation"

Moscow, Avtomatika i Telemekhanika, No 4, Apr 70, pp 94-107

The theory under investigation is that non-stochastic movements in a system may be described by the relative position of the cells. In this article, the problems are solved of determining what are the simplest sets of decision rules which can be used by the individual cells, such that a group of cells, each of which can be described by the same rules, will arrange itself in a straight line. The solution is approached by mathematical modeling on a computer.

The model chosen is a discrete time interval model. The initial state is that each point, except the end points, is connected by straight lines, making up an irregular contour. The initial state is to be a straight line in the plane, with the distance between adjacent points always equal to some desired value. Assuming that the motion of each point is controlled only by its position relative to its two neighbors (one neighbor for end points), the authors derive simple vector equations for these movements. There are two functions involved in these equations, one which causes

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Sov. Foreign Press Digest

30 OCT 70

USSR

Lomonosov, S. N., et al., Avtomatika i Telemekhanika, No 4, Apr 70, pp 94-107

the separation between adjacent points to approach the desired value and one which causes the line to become straight. The latter is in turn divided into two sub-functions, one of which is a function of the distance between the two neighbors of a point (in a row) and the other is a function of the position of the point relative to its neighbors. The requirement of a fixed distance between points of a straight line is impossible, but more closely approximates biologically realistic movement under certain conditions. The authors propose a requirement on these matrices of movement in the plane to be more like walking on a grid. This causes the line to

become straight. 1) Most initial positions were modeled, and the following conclusions were obtained: a) Initial positions converge to a straight line of the desired size over to coincide with another section, leaving a loop or a double line. b) In cases where the line is folded, the line passes through the point; 3) If the initial position has an axis of

2/3

USSR

UDC: 681.3.06:51

PYATIBRATOV, A. P.

"Organization of a Functional Check in Restorable Specialized Computer Systems"

V sb. Tsifr. vychisl. tekhnika i programmir. (Digital Computer Technology and Programming--collection of works), vyp. 6, Moscow, "Sov. radio", 1971, pp 124-129 (from RZh-Kibernetika, No 7, Jul 71, Abstract No 7V744)

Translation: A scheme is described for organization of a functional check in restorable specialized computer systems. Aggregates of specialized computer systems are classified. The order of checking aggregates of specialized computer systems during a routine cycle of the functional check is defined as well as the time of a functional check. Indices are introduced for evaluating the effectiveness of using the functional check. Author's abstract.

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USSR

UDC 681.3.06:51

PYATIBRATOV, A. P.

"Selection of Indicators of Productivity of Computers with Multiprogramming
Organization of Operations"

Tsifr. Vychisl. Tekhnika i Programmir. [Digital Computer Equipment and Programming
-- Collection of Works], No 6, Moscow, Sovetskoye Radio Press, 1971, pp 129-136,
(Translated from Referativnyy Zhurnal, Kibernetika, No 6, 1971, Abstract No 6 V615
by the author).

Translation: Indicators of the productivity of a computer with multiprogramming
organization of operation are selected. The indicators are required to select
the type of computer to be used to make up repairable specialized computer sys-
tems and for the organization of multiprogramming of the operation of these
systems. Relationships are presented for determination of the computer producti-
vity indicators.

USSR

ISC 620.179.1

YAROSLAVTSEV, O. I., MILAREV, L. D., PYATIGORSKIY, B. M., YURKIN, V. V., and
GORLOV, V. M., Scientific Research Institute of Introscopy

"Standard Functional Units for a Block System for Nondestructive Testing"

Sverdlovsk, Defektoskopiya, No 5, Oct 73, pp 138-144

Abstract: The first series of standardized functional units for block systems for nondestructive testing were developed and passed government tests at the Scientific Research Institute of Introscopy. The units were designed for completing apparatus of electromagnetic nondestructive quality control of products of the metallurgical and machine building industries and can be used in other apparatus. They were designed with all the requirements of block systems of nondestructive testing in mind and are built on semiconductor elements. Seven illustrations, and one table.

1/1

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1/2 C20
UNCLASSIFIED
PROCESSING DATE--30OCT70
TITLE--SYNAPTIC PROCESSES IN NEURONS OF CLARKE'S COLUMN PRODUCED BY AN
ANTIDROMIC VOLLEY FROM THE DORSO LATERAL FUNICULUS -U-
AUTHOR--(03)-KUSTYUK, P.G., PYATIGORSKIY, S.YA., LANG, E.
COUNTRY OF INFO--USSR
SOURCE--NEYROFIZIOLOGIYA, 1970, VOL 2, NR 3, PP 269-278
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--NERVOUS SYSTEM, NEURON, BIOPOTENTIAL
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1999/1626
STEP NO--UR/0660/70/002/003/0269/0278
CIRC ACCESSION NO--AP0123468
UNCLASSIFIED

2/2 020

CIRC ACCESSION NO--AP0123408

UNCLASSIFIED

PROCESSING DATE--30OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RESPONSES OF CLARKE'S COLUMN NEURONS TO STIMULATION OF AXONS ASCENDING IN THE DORSAL PART OF THE LATERAL FUNICULUS WERE STUDIED IN CATS UNDER NEMBUTAL CHLORALOSE ANAESTHESIA. THE ACTIVITY OF DESCENDING FIBERS IN THE FUNICULUS WAS ELIMINATED BY PREVIOUS (7-10 DAYS) IPSILATERAL HEMISECTION OF THE SPINAL CORD IN THORACIC REGION WHICH RESULTED IN THEIR DEGENERATION OR BY SEPARATE STIMULATION OF ASCENDING AXONS IN THE RESTIFORM BODY. IT WAS SHOWN THAT DURING BOTH TYPES OF THE EXPERIMENTAL PROCEDURE THE CELLS IN THE REGION OF CLARKE'S COLUMN COULD BE FOUND IN WHICH THE ANTIDROMICALLY DESCENDING VOLLEY PRODUCES NOT ACTION POTENTIALS BUT PRIMARY EXCITATORY POSTSYNAPTIC POTENTIALS (EPSP). THE LATENCY OF EPSP WAS IN AGREEMENT WITH THEIR MONOSYNAPTIC ORIGIN; THEIR DURATION REACHED 10-15 MSEC. SUCH NEURONS COULD BE ALSO SYNAPTICALLY ACTIVATED BY LOW AND HIGH THRESHOLD AFFERENTS FROM DIFFERENT MUSCLES. EVIDENTLY THEY CORRESPOND TO "BORDERCELLS" DESCRIBED MORPHOLOGICALLY BY RETHEYI (1968) WHICH RECEIVE TERMINALS FROM AXON COLLATERALS OF ASCENDING AXONS OF THE DORSAL SPINDCEREBELLAR TRACT (DSCT). IN SOME NEURONS OF THE DSCT (THOSE WITH LOW AXON CONDUCTION VELOCITY) STIMULATION OF THE DORSO LATERAL FUNICULUS RESULTED NOT ONLY IN ANTIDROMIC SPIKES BUT ALSO IN SUBSEQUENT SYNAPTIC DEPOLARIZATION WHICH MIGHT BE PRODUCED THROUGH THE "BORDER CELLS". THE POSSIBLE FUNCTIONAL ROLE OF THE FEEDBACK SYSTEM FORMED BY AXON COLLATERALS OF THE DSCT NEURONS AND "BORDER CELLS" IS DISCUSSED. FACILITY: THE A. A. BOGOMOLETZ INSTITUTE OF PHYSIOLOGY, ACADEMY OF SCIENCES, UKRAINIAN SSR, KIEV.

UNCLASSIFIED

Acc. Nr: **AP0044105**

PRIMARY SOURCE: *Neyrofiziologiya*, 1970, Vol 2, Nr 1, PP **26-34**

Ref. Code: **UR 0660**

**BACKGROUND ACTIVITY OF NEURONS OF DORSAL
SPINOCEREBELLAR TRACT**

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The A. A. Bogomoletz Institute of Physiology, Academy
of Sciences, Ukrainian SSR, Kiev

Summary

Background activity (BA) of dorsal spinocerebellar tract (DSCT) neurons was studied under conditions of experimental limitation of afferent inputs to these neurons. Complete unilateral deafferentation leads to complete suppression of BA in most DSCT neurons. Under conditions of partial deafferentation it is possible to classify BA in

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two types accordingly to characteristics of interspike interval distribution (the 1st type $\bar{x} > 100$ msec, $\sigma > 15$ msec; the 2nd type $\bar{x} < 100$ msec, $\sigma < 15$ msec). It is supposed that type of BA is determined by functional state of afferent inputs. Presence of activation of DSCT neurons leads to the formation of the 2nd BA type.

Subnormality is developed in DSCT neurons after spike generation, its duration being 50 msec and more. Accumulation of subnormality causes negative values of the 1st order serial correlation coefficients. If BA has lower frequencies, than the 1st order serial correlation coefficients are positive.

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PYATIGORSKIY, G. M.

UDC 537.58

"On Chemical Equilibrium in the Threshold Region During Surface Ionization of Molecules"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, Vol XLI, No 8, 1971, pp 1723-1725

Abstract: In a recent article by N. D. Potekhin (Zh.T.F., XL, 620, 1970), expressions were obtained for the speeds of association and dissociation of molecules of molybdenum chromium along the surface of a metal in which they are being ionized, and a criterion of equilibrium was derived. This criterion indicated that equilibrium can occur only in the low-temperature part of the ionization threshold. However, this criterion was derived only for $\delta \gg 1$, δ being the ratio of the constants of the speeds of desorption and dissociation along the surface. In the present article, a general criterion of equilibrium, valid for all values of δ , is developed and discussed. This general criterion postulates the existence of equilibrium throughout the entire threshold region.

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Acc. Nr:

AP0047634

Abstracting Service:
CHEMICAL ABST. 5/70

Ref. Code:

4R 0057

105091v Negative surface ionization of iodine on single-crystal bands of molybdenum and tungsten. Chaikovskii, E. F.; Mel'nik, L. G.; Pyatigorskii, G. M. (USSR). Zh. Tekh. Fiz. 1970, 40(1), 225-8 (Russ). The temp. dependence of the production of I^- was studied in the process of I vapor ionization on heated single-crystal strips of Mo and W used as emitters. Curves are shown for the dependences of ion current on I vapor pressure (10^{-4} - 10^{-1} torr) and on emitter temp. (2300-1400°K). These dependences of the ion current obey the Saha-Langmuir equations. At 10^{-4} torr and 1550°K, a deviation occurs which is due to a change of work function caused by I adsorption.

V. Burjan

REEL/FRAME
19791206

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Acc. Nr: **AP0047345**

Ref. Code: **UR0206**

PRIMARY SOURCE: Vestnik Dermatologii i Venerologii, 1970,
Nr 1, pp 79-82

SOME NEW FORMS IN THE WORK OF DERMATO-VENEROLOGICAL INSTITUTIONS
FOR CONTROL OF VENEREAL DISEASES OF THE UROGENITAL ORGANS

S. L. Kozin, A. I. Puatikon

Summary

Insufficient success in control of gonorrhea is due mostly to medico-biological factors including greater frequency of primary torpidity and resistance to antibiotics, untimely detection of patients and errors in diagnosis, shortcomings of organizational nature.

It is suggested that forms of registration of patients, methods of control after treatment and organization of work of dermatovenereological service be changed, and also work be extended on active detection of patients, development of new methods for diagnosis and therapy, investigation of epidemiology of gonococcal and non-gonococcal inflammatory diseases of the urogenital organs.

REEL/FRAME
19790871

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UNCLASSIFIED

PROCESSING DATE--16OCT70

TITLE--PHASE COMPOSITION OF MAGNESITE CHROMITE REFRACTORIES WITH GUNITE
COATINGS AFTER SERVICE IN THE ROOF OF AN OPEN HEARTH FURNACE -U-
AUTHOR--(05)--PYATIKOP, P.D., PIROGOV, YU.A., BOLTYANSKIY, A.V., GURSKIY,
G.L., KOBYLKO, V.S.
COUNTRY OF INFO--USSR

SOURCE--OGNEUPORY 1970, 35(3), 37-40

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--OPEN HEARTH FURNACE, SPINEL, OXIDE REFRACTORY, PHASE
COMPOSITION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1996/0875

STEP NO--UR/0131/70/035/003/0037/0040

CIRC ACCESSION NO--AP0118046

UNCLASSIFIED

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CIRC ACCESSION NO--AP0118046

UNCLASSIFIED

PROCESSING DATE--16OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FOR THE COATING OF REFRACTORIES GUNITE POWDER OF COMPN. CR SUB2 O SUB3 31.5-7.7, MGO 33.8-42.8, CAO 0.54-1.6, AL SUB2 O SUB3 4.7-6.5, SIO SUB2 4.2-5.5, AND FE SUB2 O SUB3 8.5-10.5PERCENT WAS USED. ON THE BRICKS WITH GUNITE COATINGS AFTER SERVICE IN THE ROOF OF AN OPEN HEARTH FURNACE 4 STRUCTURAL ZONES WERE FOUND: (1) SLIGHTLY CHANGED ZONE, 100-50 MM THICK, (2) THE TRANSITION ZONE, 30-60 MM, (3) WORKING ZONE, 15-25 MM, AND (4) GUNITE COATING ZONE, 20-5 MM. IN THE DIRECTION FROM (1) TO (4) THE CONTENT OF CAO, FEO, FE SUB2 O SUB3 INCREASES WHILE THAT OF MGO AND CR SUB2 O SUB3 DECREASES. THE MAX. SIO SUB2 CONTENT IS FOUND IN (2). (1) SHOWS THE NONUNIFORM GRANULAR STRUCTURE; IT CONSISTS OF PERICLASE (60-70), CR SPINEL (25-30), AND SILICATES (10-12PERCENT). THE PERICLASE (0.2-2.5) AND CR SPINEL (0.5-3.0 MM) GRAINS ARE CEMENTED WITH A FINE GRANULAR MASS. THE SILICATES ARE REPRESENTED BY MONTICELLITE AND RARELY BY FORSTERITE. THE HOMOGENEOUS DISTRIBUTION OF PORES OF THE CRACK FORMS IS OBSERVABLE. (2) IS ANALOGOUS TO (1) ACCORDING TO THE MINERALOGICAL COMPN. BUT IT DIFFERS FROM (1) IN THE FOLLOWING ASPECTS: (1) IT HAS A MORE UNIFORMLY DISTRIBUTED PERICLASE GRAINS, (B) THE PERICLASE GRAINS ARE LARGER, (C) A CONSIDERABLE HIGHER CONTENT (18PERCENT) OF SILICATES IN WHICH MONTICELLITE PREVALIS, (D) THE PRACTICAL ABSENCE OF FINE CRACKS AND ON THE OTHER HAND THE PRESENCE OF LARGE AMT. OF PORES OF SIZES 0.03-1 MM. (3) IS COMPOSED OF SECONDARY SPINEL, CR SPINEL PERICLASE, AND SILICATES. THE SECONDARY SPINELS FORM THE MAIN COMPONENT (63-70PERCENT) WITH BLACK GRAINS 0.05-0.3 MM.

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CIRC ACCESSION NO--AP0118046
ABSTRACT/EXTRACT--THE CR SPINEL AND SECONDARY SPINEL GRAINS ARE IN CLOSE

UNCLASSIFIED

PROCESSING DATE--16OCT70

CONTACT. THE PERICLASE IN THE FORM OF CORRODED GRAINS IS CLOSELY
PERMEATED WITH THE SECONDARY SPINEL INCLUSIONS. SILICATES ARE PRESENT
AS MONTICELLITE AND MERWINITE. ZONE (4) CONSISTS OF SECONDARY SPINEL
(85-8), CR SPINEL (SIMILAR TO 6), AND SILICATES (6-15PERCENT).
FACILITY: UKR. NAUCH.-ISSLED. INST. OGNEUPOR., KHARKOV, USSR.

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~~RYATIKOV, P. D.~~, PIROGOV, YU. A., BOLTYANSKIY, A. V., GURSKIY,
G. L., KOBYLKO, V. S.

"Phase Composition of Magnesite-Chromite Refractories With
Gunitite Coatings After Service in the Crown of an Open-Hearth
Furnace"

Moscow, Ogneupory, No 3, Mar 70, pp 37-40

Abstract: Guniting the rear walls of open-hearth furnaces at
"Zaporozhstal'" plant has increased their life from 180-200 to
500 and more cycles. The rear wall is gunited with a semidry
powder mixture at least once per day. The composition of the
powder is: 31.5-37.7% Cr_2O_3 , 33.8-42.8% MgO , 0.54-1.6% CaO ,
4.7-6.5% Al_2O_3 , 4.2-5.5% SiO_2 , 8.5-10.5% Fe_2O_3 , weight loss
1.7-3.0%. The powder contains not over 7% particles over 1 mm,
20-25% particles less than 0.071 mm. The binder and moistener
used is an aqueous solution of liquid glass with a density of
1.17-1.20 g/cm³. The authors studied the chemical and phase
compositions of the magnesite-chromite refractories which had
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PYATIKOP, P. D., et al., Ogneupory, No 3, Mar 70, pp 37-40

been used in the rear line of the crown of an open-hearth furnace operating with oxygen injection. Photographs showing the general appearance and microstructure of the refractories are presented, as well as a graph of the oxide content of the refractories after usage. The guniting of the working surface of the refractories forms a layer of highly refractory materials, protecting the brick from the effects of dust, preventing deep penetration of silicate melts into the cold zones of the brick, and consequently decreasing the rate of conversion of the brick and the intensity of brick wear during service.

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USSR

PYATKIN, A. M., BORODYUK, V. M.

"Method of Combined Optimization of Development of Raw Material Bases and Processing Enterprises"

Mekhaniz. Ucheta i Vychisl. Rabot. Mezhd. Nauch. sb. [Mechanization of Accounting and Computer Operations, Interdepartmental Scientific Collection], No 13, 1971, pp 120-127, (Translated from Referativnyy Zhurnal, Kibernetika, No 2, 1972, Abstract No 2 V651, unsigned).

Translation: A model with Boolean variables is presented. The method of solution of the linear problem by a simplex method with subsequent rounding off is suggested for solution.

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USSR

PYATKIN, V. P., Computing Center, Siberian Department of the Academy of Sciences of the USSR

UDC: 8.74

"Method of Approximation in the Problem of Synthesizing a Threshold Element"

Metod approksimatsii v zadache sinteza porogovogo elementa (cf. English above), Novosibirsk, 1972, 8 pp, biblio. 4 titles, 4023-72 Dep. (from RZh-Kibernetika, No 6, Jun 72, Abstract No 6V499 DEP)

Translation: A machine program realizing synthesis of a threshold element by the method of approximation was used on a digital computer to process about three thousand functions of logic algebra, all being logic algebra functions of up to seven variables. This experiment established a number of interesting facts on the relation between the number of variables and the effectiveness of the method of approximation, and also resulted in a more precise determination of certain estimates of this effectiveness proposed previously. A more effective modified method of approximation is considered, and a digital computer program is written out and debugged for this modified method. Author's abstract.

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UDC 591.488.4-135.044:597.82

VINNIKOV, Ya. A., GAZENKO, O. G., TITOVA, L. K., GOVAREVSKIY, V. I.,
GRIBAKIN, F. G., BRONSHTEYN, A. A., PEVZNER, R. A., ARONOVA, M. Z.,
MASHINSKIY, A. L., PAL'MBAKH, L. R., IVANOV, V. P., TSIRULIS, T. P.,
KHARKEYEVICH, T. A., and PYATKINA, G. A., Laboratory of Evolutional
Morphology, Institute of Evolutionary Physiology and Biochemistry imeni
I. M. Sechenov, Academy of Sciences USSR, Leningrad

"Development of the Vestibular Apparatus (Labyrinth) of the Frog Rana
temporaria in Weightlessness"

Leningrad, Zhurnal Evolyutsionnoy Biokhimii i Fiziologii, Vol 8, No 3,
May/Jun 72, pp 343-350

Abstract: To study the effect of weightlessness on development of vertebrate
vestibular apparatus, 43-hour artificially fertilized Rana temporaria eggs
were subjected to a 40-hour flight in the Soyuz-10, after which they were
fixed and observed with an electron microscope. Embryos in the early gastrula
stage were used to ensure that takeoff acceleration was experienced prior to
establishment of definitive vestibular apparatus, in light of evidence that
acceleration does have considerable impact on receptor cell development at
the later stages. Normal development proceeded to the tail bud stage during
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